SIEMENS

4891

SSB.. without auxiliary switch

SSB..1 with auxiliary switch

ACVATIX™

# Electromotoric actuators

**SSB31..**
**SSB81..**
**SSB61..**

for small valve types VVP45.., VXP45.., VMP45..
(DN ≤ 25, $k_{VS}$ ≤ 6,3 $m^3$/h)

- **SSB31.. operating voltage AC 230 V 3-position control signal**
- **SSB81.. operating voltage AC 24 V 3-position control signal**
- **SSB61.. operating voltage AC / DC 24 V DC 0…10 V control signal**
- **Nominal force 200 N**
- **Automatic identification of valve stroke**
- **Direct mounting with union nut, no tools required**
- **Basic types complete with plug-in connecting cable, length 1.5 m**
- **Optional cable types**
  - **Cable length 1.5 m, 2.5 m and 4.5 m**
  - **Halogen-free cables**
- **Manual override and position indication**
- **Parallel connection of multiple actuators possible**
- **Auxiliary switch integrated in SSB31.1 and SSB81.1 actuators**

## Use

For operation of Siemens valves V..P45.. for water-side control of hot and cooling water in heating, ventilation and air conditioning systems.

## Type summary

### Standard versions

| Type reference | Operating voltage | Run time at 50 Hz | Control signal | Connecting cable | Auxiliary switch |
|---|---|---|---|---|---|
| **SSB31** | AC 230 V | 150 s | 3-position | 1.5 m | |
| **SSB31/00** [1)] | | | | no cable | |
| **SSB31.1** | | | | 1.5 m | Yes |
| **SSB81** | AC 24 V | | | 1.5 m | |
| **SSB81/00** [1)] | | | | no cable | |
| **SSB81.1** | | | | 1.5 m | Yes |
| **SSB61** | AC / DC 24 V | 75 s | DC 0…10 V | 1.5 m | |
| **SSB61/00** [1)] | | | | no cable | |

[1)] Available cable lengths or terminal block connectors refer to «Accessories», page 3

SSB81.., SSB61.. are UL and cUL approved.

### Accessories

| Type reference | Description | Operating voltage | Control signal |
|---|---|---|---|
| **ASY3L15** | Connecting cable 1.5 m | AC 230 V | 3-position |
| **ASY3L25** | Connecting cable 2.5 m | | |
| **ASY3L45** | Connecting cable 4.5 m | | |
| **ASY6L15** | Connecting cable 1.5 m | AC / DC 24 V | DC 0…10 V |
| **ASY6L25** | Connecting cable 2.5 m | | |
| **ASY6L45** | Connecting cable 4.5 m | | |
| **ASY6L45HF** | Connecting cable 4.5 m, halogen-free, VDE 0207-24 | | |
| **ASY8L15** | Connecting cable 1.5 m | AC 24 V | 3-position |
| **ASY8L25** | Connecting cable 2.5 m | | |
| **ASY8L45** | Connecting cable 4.5 m | | |
| **ASY8L45HF** | Connecting cable 4.5 m, halogen-free, VDE 0207-24 | | |
| **ASY98** | Retaining screw for terminal block connector. Included in ASY99 and ASY100. | | |
| **ASY99** | Terminal block connector for 3-position actuators SSB81.. /00 | | |
| **ASY100** | Terminal block connector for DC 0…10 V modulating actuators SSB61.. | | |

## Ordering

Example:

| *Type* | *Stock no.* | *Description* | *Quantity* |
|---|---|---|---|
| SSB81/00 | SSB81/00 | Electromotoric actuator | 2 |
| ASY99 | ASY99 | Terminal block | 2 |

Delivery

Actuators, valves and accessories are packed separately. Items are supplied individually packed.

**Rev.-No.**

Overview tables, see page 9.

## Equipment combinations

| Type reference | Valve type | $k_{vs}$ [$m^3/h$] | PN class | Data sheet |
|---|---|---|---|---|
| **VVP45..** | 2-port valves | 0.25…6.3 | PN 16 | N4845 |
| **VVP45..S** | 2-port valves, for CONEX compression fittings | 0.63…2.5 | | N4854 |
| **VXP45..** | 3-port valves | 0.25…6.3 | | N4845 |
| **VMP45..** | 3-port valves with T-bypass | 0.25…4.0 | | |
| **VMP45..S** | 3-port valves with T-bypass, for CONEX compression fittings | 0.63…2.5 | | N4854 |

$k_{vs}$ = nominal flow rate of cold water (5...30 °C) through the fully open valve ($H_{100}$) at a differential pressure of 100 kPa (1 bar)

## Function / mechanical design

When the actuator is driven by DC 0…10 V control voltage or by a 3-position signal, it produces a stroke which is transmitted to the valve stem.
The description of operation in this document applies to the valve versions which are fully closed when de-energized (NC valves).

**3-position control signal**
SSB31../SSB81..

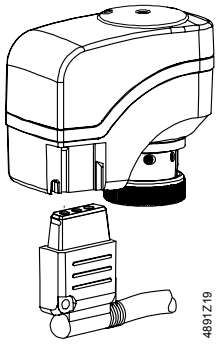
- Voltage at Y1: Stem extends Valve opens
- Voltage at Y2: Stem retracts Valve closes
- No voltage at Y1 and Y2: Actuator maintains its current position

**DC 0...10 V control signal**
SSB61..

- The valve opens / closes in proportion to the control signal at Y.
- At DC 0 V, the valve V..P45.. is fully closed (A → AB).
- When power supply is removed, the actuator maintains its current position.

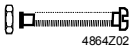
**Features and benefits**

- Plastic housing
- Locking-proof, maintenance-free gear train
- Manual override with hexagonal socket wrench 3 mm
- Reduced power consumption in the holding positions
- Load-dependent switch-off in the event of overload and in stroke end positions
- Parallel operation of 6 SSB31.., 24 SSB81.. and 10 SSB61.. possible, provided the controllers' output is sufficient
- Terminal block connectors for customer made cables available
  (only for use with AC 24 V and AC / DC 24 V actuators)
- Connecting cables with AC 24 V and AC 230 V connectors cannot be mixed up
- Halogen-free cables available

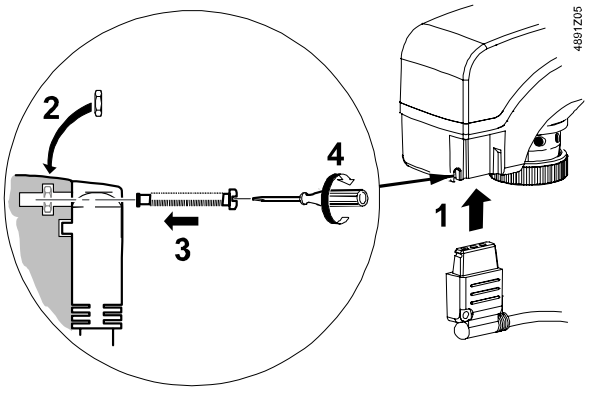



## Accessories

**Retaining screw**
ASY98

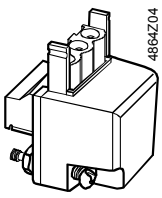



Type ASY98 to secure the cable connector. Included in ASY99 and ASY100.




The cable connector snaps into position, but can be additionally secured with the retaining screw.

**Terminal block connectors**
ASY99
ASY100




For special cable lengths of the AC / DC 24 V actuators.

- Type ASY99 for 3-position actuators SSB81/00
- Type ASY100for DC 0…10 V modulating actuators SSB61/00

The terminal block connectors are supplied complete with Mounting Instructions (74 319 0385 0).

## Notes

**Engineering**

The actuators must be electrically connected in accordance with local regulations (refer to «Connection diagrams»), page 8.

**⚠ Caution**

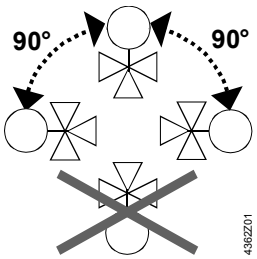
**Regulations and requirements to ensure the safety of people and property must be observed at all times!**

The permissible temperatures (refer to «Technical data», page 6) must be observed.
The connecting cable of the actuator may come into contact with the hot valve body, provided the temperature of the valve body does not exceed 80 °C.
SSB 31.1.. and SSB81.1.. actuators have an auxiliary switch ready integrated.
Subsequent fitting to other types of actuators is not possible.

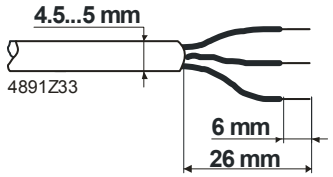
**Mounting**

The Mounting Instructions 4 319 0497 0 are enclosed in the product packaging.
Assembly is made with the union nut; no tools or adjustments are required. The actuator must be fitted in position 0 (also refer to «Manual override», page 5) without operating voltage.
In the case of actuators without connecting cable (SSB../00), the separately ordered terminal block connector and connecting cable must be fitted.

Orientation




**Installation**




Crimp ferrule on stripped wire of connecting cable.

**Commissioning**

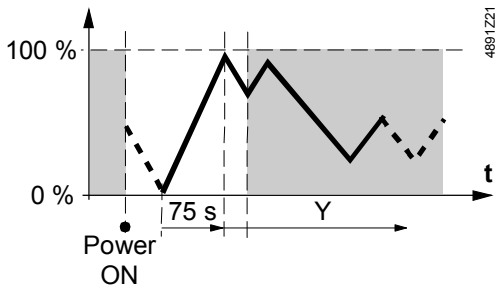
When commissioning, check wiring and the functioning of the actuator and auxiliary switch, if fitted.

- Actuator stem extends (from position 0 to 1): Valve opens
- Actuator stem retracts (from position 1 to 0): Valve closes

**Self-calibration**

**⚠ Caution**

**During commissioning and whenever the operating voltage is switched on, the SSB61.. runs a self-calibration routine. (Valve stroke 0 → Max. stroke → Setpoint). Never intervene manually in this process.**




**Note: Correct calibration is only possible**

- **with valve**
- **stroke > 1.5 mm**

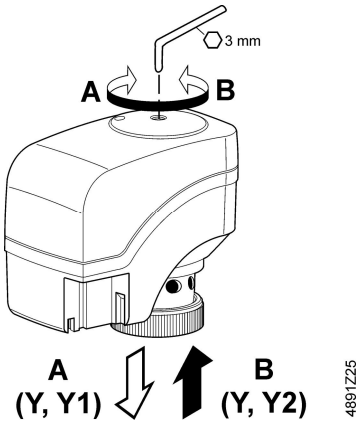
**The second or third attempt at calibration occurs automatically after an 8-minute delay.**
**After three failed calibration attempts the actuator stem remains in the extended position and the V..P45.. valves are opened.**
**For valves with strokes < 1.5 mm, the actuator/valve combination locks after three failed calibration attempts.**

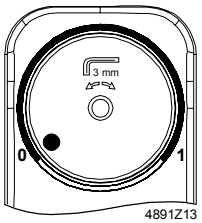
**Manual override**

A 3 mm hexagonal socket wrench can be used to move the actuator to any position between 0 and 1. If a control signal from the controller is present, then this takes priority in determining the position.

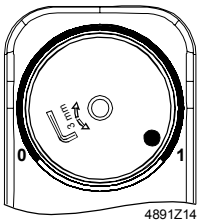
Note

To retain the manually set position, unplug the connecting cable or switch off power and the control signal.




Position indicator in position 0: Valve closed




Position indicator in position 1: Valve open

**Maintenance**

The actuators are maintenance-free.
When carrying out service work on the plant, following must be noted:

- Turn power off (e.g. remove the plug)
- If necessary, disconnect electrical connections from the terminals
- The actuator must be commissioned only with a correctly mounted valve in place!

Repair

SSB.. actuators cannot be repaired; the complete unit must be replaced.

**Disposal**

The device must not be disposed of together with domestic waste. This applies in particular to the PCB.
Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.
**Current local legislation must be observed.**

**Warranty**

The technical data given for these applications is valid only when the actuators are used with the Siemens valves listed under «Equipment combinations», page 2.

**The use of the SSB.. actuators in conjunction with third-party valves invalidates any warranty offered by Siemens Switzerland Ltd / HVAC Products.**

## Technical data

| | | SSB31.. | SSB81.. | SSB61.. |
|---|---|---|---|---|
| Power supply | Operating voltage | AC 230 V | AC 24 V | AC 24 V or DC 24 V |
| | Voltage tolerance | ± 15 % | ± 20 % | ± 20 % ± 25 % |
| | Rated frequency | 50 / 60 Hz | | |
| | Max. power consumption | 6 VA | 0.8 VA | 2.5 VA |
| | ⚠ Fuse for incoming cable | 2 A, quickblow | | |
| Control | Control signal | 3-position | | DC 0...10 V |
| | Input impedance for DC 0...10 V | | | > 100 kOhm |
| | Parallel operation (number of actuators) [1] | max. 6 | max. 24 | max. 10 |
| Functional data | Run time for 5.5 mm stroke at 50 Hz | 150 s | | 75 s |
| | Positioning speed | 27.3 s/mm | | 13.6 s/mm |
| | Nominal stroke | 5.5 mm | | |
| | Nominal force | 200 N | | |
| | Perm. temperature of medium in the connected valve | 1...110°C | | |
| Electrical connections | Connecting cable of basic types | 1.5 m 3-core to EN 60320 / IEC 60227 | | |
| | ASY 99, ASY100 cable diameter | | < 5 mm | |
| | wire cross section | | 0.5…0.75 mm$^2$ | |
| | ASY3L.. wire cross section | 0,75 mm$^2$ | | |
| | ASY6L.., ASY8L.. wire cross section | | 0,5 mm$^2$ | |
| Standards | Meets requirements for CE marking: EMC directive | 2004/108/EC | | |
| | Immunity | EN 61000-6-2 | Industrial [2] | |
| | Emission | EN 61000-6-3 | Residential | |
| | Low voltage directive | 2006/95/EC | | |
| | Electrical safety | EN 60730-1 | | |
| | Protection class to EN 60730 | II | III | |
| | Contamination level | EN 60730, Class 2 | | |
| | Housing protection Upright to horizontal | IP40 to EN 60529 | | |
| | UL approbation | | UL 873 | |
| | cUL approbation | | C22.2 No. 24-93 | |
| | Environmental compatibility | ISO 14001 (Environment)<br>ISO 9001 (Quality)<br>SN 36350 (Environmentally compatible products)<br>RL 2002/95/EG (RoHS) | | |
| Dimensions / weight | Dimensions | refer to «Dimensions», page 9 | | |
| | Coupling thread to valve | union nut G¾ inch | | |
| | Weight with / without auxiliary switch | 0.4 kg / 0.35 kg | | |
| Housing colors | Base and cover | RAL 7035 light gray | | |
| Auxiliary switch | Mounted in SSB31.1 and SSB81.1 | 1 change-over switch | | |
| | Switching point adjustable Factory setting 50 % | 0...100% | | |
| | Switching capacity [3] | max. AC 250 V, 1 A (0.5 A) | | |
| | Connecting cable (recommended) | H03VV-F, 2x0.5…0.75 mm$^2$ | | |

[1] Provided the controllers' output is sufficient

[2] Transformer 160 VA (e.g. Siemens 4AM3842-4TN00-0EA0) for AC 24 V actuators

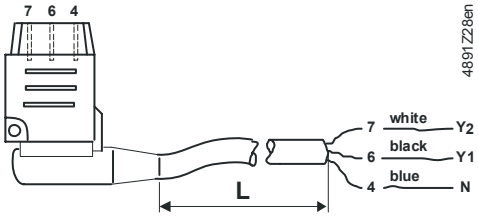
[3] SSB81, in installations according to UL standards, AV 24 V, 1 A (0.5 A)

**General ambient conditions**

| | Operation EN 60721-3-3 | Transport EN 60721-3-2 | Storage EN 60721-3-1 |
|---|---|---|---|
| Environmental conditions | Class 3K3 | Class 2K3 | Class 1K3 |
| Temperature | 1...50 °C | -25...70 °C | -5...50 °C |
| Humidity | 5...85 % r.h. | < 95 % r.h. | 5...95 % r.h. |

## Connecting cable

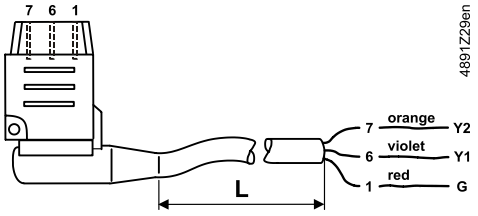
ASY3L.. with SSB31..




| | | | |
|---|---|---|---|
| 7 | White | Y2 | Control signal CLOSE (AC 230 V) |
| 6 | Black | Y1 | Control signal OPEN (AC 230 V) |
| 4 | Blue | N | Neutral |

L = 1,5 m, 2,5 m, or 4,5 m

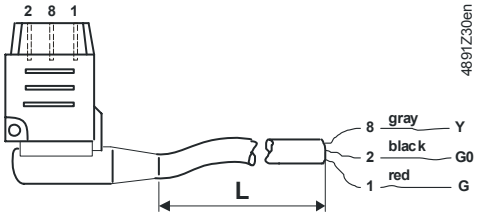
ASY8L.. with SSB81..




| | | | |
|---|---|---|---|
| 7 | Orange | Y2 | Control signal CLOSE (AC 24 V) |
| 6 | Violet | Y1 | Control signal OPEN (AC 24 V) |
| 1 | Red | G | System potential AC 24 V |

L = 1,5 m, 2,5 m, or 4,5 m

ASY6L.. with SSB61..

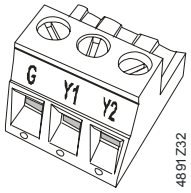


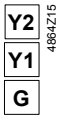

| | | | |
|---|---|---|---|
| 8 | Grey | Y | Control signal DC 0...10 V |
| 2 | Black | G0 | System neutral (- DC 24 V) |
| 1 | Red | G | System potential AC 24 V (+ DC 24 V) |

L = 1,5 m, 2,5 m, or 4,5 m

## Connection terminals

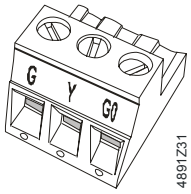
ASY99
for SSB81..

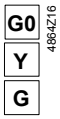



Control signal CLOSE
Control signal OPEN
System potential AC 24 V

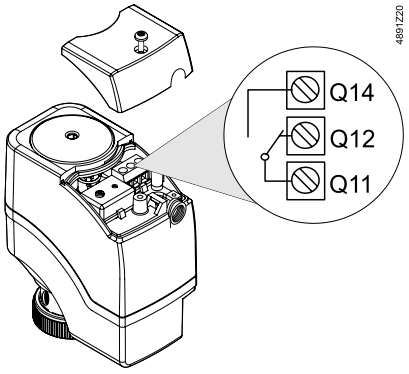
ASY100
for SSB61..




System neutral
Control signal DC 0...10 V
System potential AC/DC 24 V

**Terminals for auxiliary switches**
SSB31.1, SSB81.1




**Factory setting:**

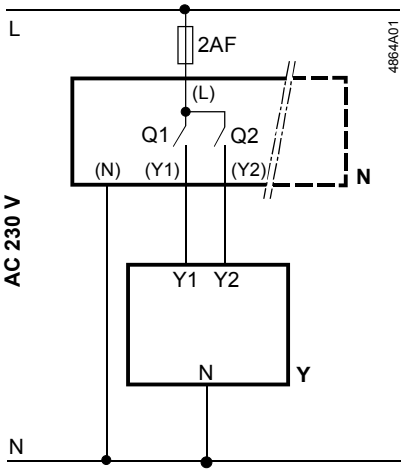
0...50 % Q11 → Q12
50...100 % Q11 → Q14

The switching point can be adjusted by turning the switching cam with a screwdriver (see Mounting Instructions).

Recommended connecting cable: H03VV-F, 2x0.5…0.75 mm$^2$.

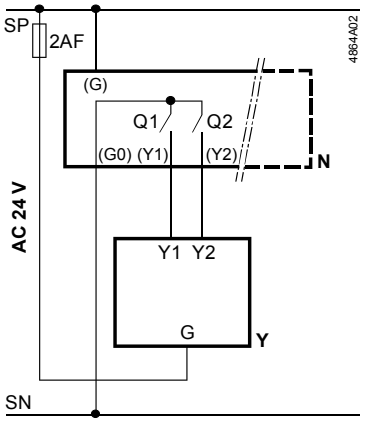
## Connection diagrams

SSB31..



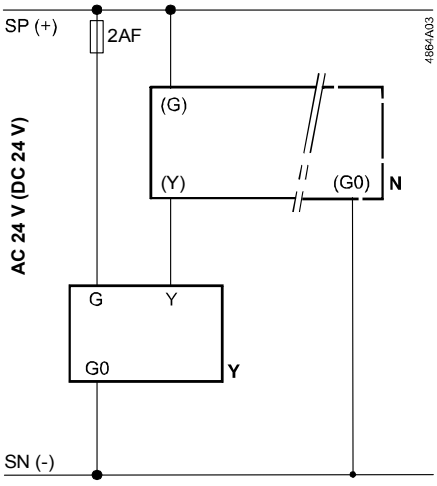

| | |
|---|---|
| N | Controller |
| Y | Actuator |
| L | System potential AC 230 V |
| N | System neutral |
| Y1, Y2 | Control signal OPEN, CLOSE |
| Q1, Q2 | Controller contacts |

SSB81..




| | |
|---|---|
| N | Controller |
| Y | Actuator |
| SP, G | System potential AC 24 V |
| SN, G0 | System neutral |
| Y1, Y2 | Control signal OPEN, CLOSE |
| Q1, Q2 | Controller contacts |

SSB61..

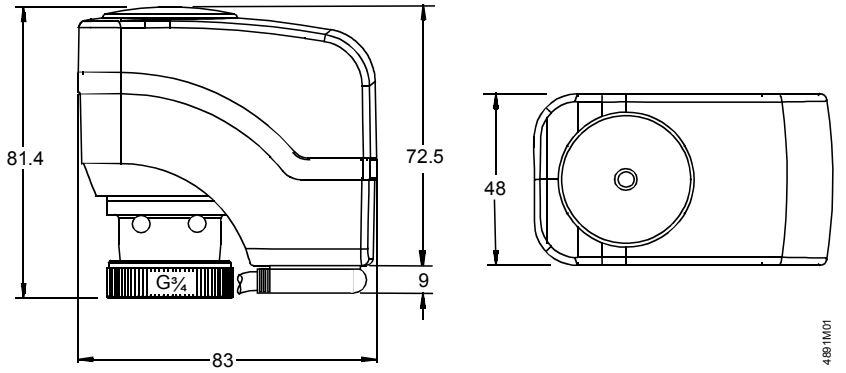



| | |
|---|---|
| N | Controller |
| Y | Actuator |
| SP, G | System potential AC 24 V |
| SN, G0 | System neutral |
| Y | Control signal DC 0…10 V |

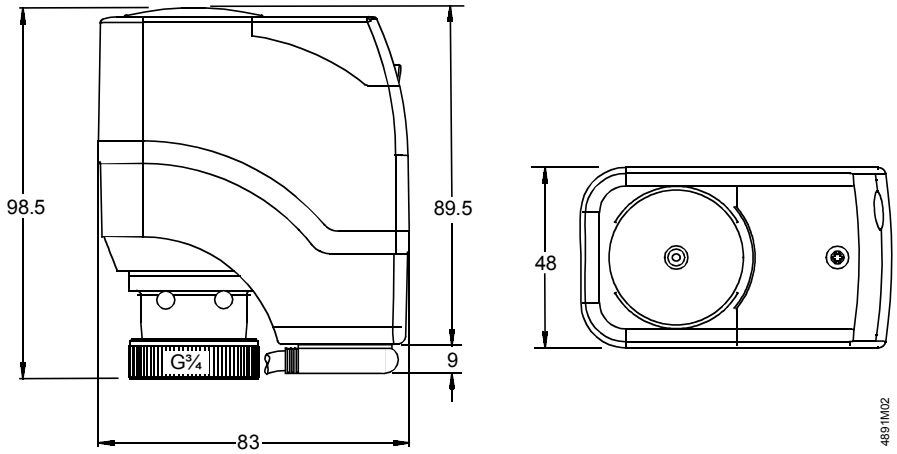
## Dimensions

All dimensions in mm

**Actuator without auxiliary switch**
SSB31..
SSB81..
SSB61..




**Actuator with auxiliary switch**
SSB31.1..
SSB81.1..




## Revision numbers

| Type reference | Valid from Rev.-No. | Type reference | Valid from Rev.-No. |
|---|---|---|---|
| SSB31 | J | SSB61 | J |
| SSB31/00 | J | SSB61/00 | J |
| SSB31.1 | J | | |
| SSB81 | J | | |
| SSB81/00 | J | | |
| SSB81.1 | J | | |

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